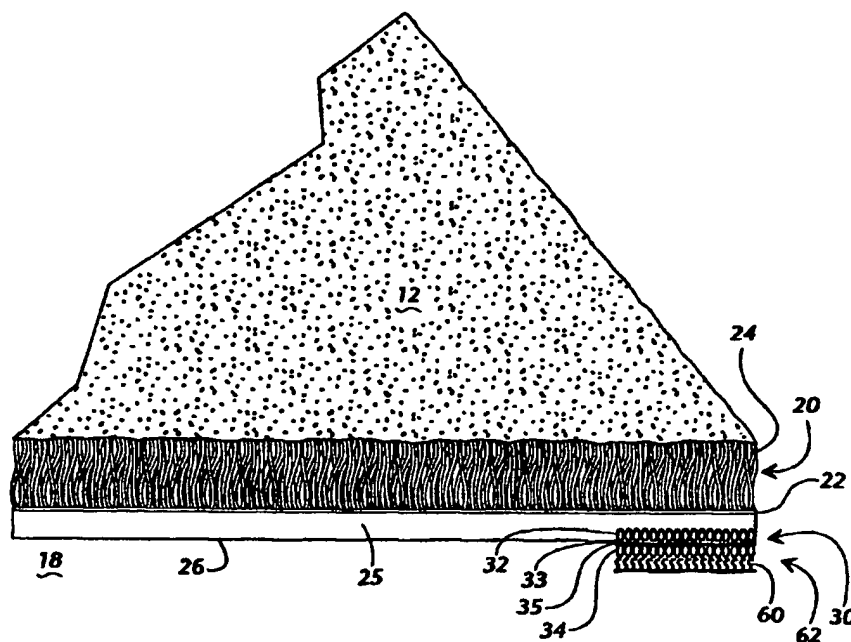




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(54) Title: A SELECTIVELY ATTACHABLE FLOOR COVERING AND METHOD OF MAKING THE SAME



(57) Abstract

The present invention provides a selectively attachable floor covering (20) capable of withstanding frequent laundering and a method of making the same. The floor covering (20) is a mat (12) including a rubber base (25) and at least one fastener (30). The fastener (30) comprises selectively attachable material (32) extending into the mat's base (25) for permanent attachment therewith and selectively attachable material (34) protruding from the base for selective attachment with a floor (58).

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**“A SELECTIVELY ATTACHABLE FLOOR
COVERING AND METHOD OF MAKING THE
SAME”**

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Technical Field

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The present invention relates generally to selectively attachable floor coverings, and more particularly to a selectively attachable mat capable of withstanding frequent laundering and to a method of making the same.

20

Background of the Invention

25

Removable floor coverings such as mats are well known in the prior art for use at entrance ways of commercial buildings to collect dirt and water tracked into the building. Accordingly, mats prevent permanent floor coverings, such as carpets, that cannot be easily cleaned or replaced from becoming heavily soiled.

30

After a period of use, mats become saturated with dirt and water and must be replaced with a clean mat. Typically, mats are replaced after a predetermined period of use, such as one week.

35

To reduce the expense associated with providing a clean mat, it is preferable that the mat is commercially launderable, and thus reusable. Commercially laundering, however, is abusive to mats because of the water temperature and the detergents necessarily involved. Consequently, a mat may crinkle, shrink or

even be destroyed after only a few cycles of use and laundering.

5 Because of this problem, mats have been constructed in the prior art with a rubber backing that provides support for the carpet portion of a mat. Besides support, the rubber backing also provides an excellent cushion for the mat during use.

10 A problem with rubber backed mats, however, is providing a system for fastening such a mat to the floor. The fastening system should be inexpensive and able to withstand frequent commercial laundering of the mat. Moreover, the system should hold the mat firmly in place, but allow the mat to be easily removed and replaced. Without such a fastening system, the mat is
15 subject to being inadvertently pushed and sliding out of position. Additionally, the mat may slide out from under a user and cause a slip and fall accident. Thus, a rubber backed mat needs to be fastened to the floor to prevent such movement.

20 The problem with the use of fastening systems on rubber backed mats is getting a fastener to adhere to the rubber backing in a manner that can withstand frequent commercial laundering. In this regard, adhesives break down after only a couple cycles of commercial
25 laundering. Alternative methods of attachment, such as sewing or ultrasonic welding, are expensive and thus do not provide an adequate solution to the problem.

30 Thus, there exists a need in the art for an effective fastening system for rubber backed mats and similar floor coverings. The fastening system should be inexpensive and able to withstand frequent commercial laundering of the mat. Additionally, the fastening system should hold the mat firmly in place, but allow the mat to be selectively removed with ease for laundering.

Summary of the Invention

5 The present invention provides a solution to solving the problems in the art described above by providing a selectively attachable floor covering capable of withstanding frequent laundering and a method of making the same.

10 The floor covering is a mat including a rubber base and one or more fasteners. Each fastener comprises selectively attachable material extending into the rubber base for permanent attachment therewith and selectively attachable material protruding from the rubber base for selective attachment with a mating fastener on the floor.

15 The selectively attachable material extending into the rubber base is permanently attached therein by the process of vulcanization when the base is cured. During the curing process, heat softens the rubber base while pressure forces the selectively attachable material extending toward the rubber base into the same. Accordingly, the rubber base is cross linked with the material as the sheet is cured to form a permanent bond.
20 The resulting mat of the present invention can withstand repeated laundering without the fastener becoming separated from the rubber base.

25 Thus, it is an object of the present invention to provide an improved slip resistant floor covering.

It is another object of the present invention to provide a selectively attachable floor covering.

30 It is a further object of the present invention to provide a floor covering capable of withstanding frequent laundering.

It is still further an object of the present invention to provide a selectively attachable floor covering capable of withstanding frequent laundering.

35 It is yet another object of the present invention to provide a method for making a selectively attachable floor covering capable of withstanding frequent

laundrying.

Further objects, features and advantages of the present invention will become apparent upon reviewing the following description of the preferred embodiments of the invention, when taken in conjunction with the drawings and appended claims.

Brief Description of the Drawings

Fig. 1 is a perspective view of a mat used in an entry way of a commercial building in accordance with the preferred embodiment of the present invention.

Fig. 2 is a perspective view of the mat of Fig. 1, showing a carpet, a rubber base, and a fastener in accordance with the preferred embodiment of the present invention.

Fig. 3 is an enlarged perspective view of a corner of the mat of Fig. 1, showing the construction of the fastener and of a mating fastener in accordance with the preferred embodiment of the present invention.

Fig. 4 is a side view of a press for making the mat of Fig. 1 in accordance with the preferred embodiment of the present invention.

Detailed Description

Referring now in more detail to the drawings, in which like numerals refer to like parts throughout the several views, Fig. 1 shows a selectively attachable floor covering capable of withstanding frequent laundrying in accordance with the preferred embodiment of the present invention.

In the preferred embodiment, the floor covering is a mat 12 used at an entrance way 14 of a commercial building 16 to collect dirt and water tracked therein. Accordingly, the mat 12 prevents soiling and damage to a carpet or other permanent floor covering that cannot be easily cleaned or replaced.

In accordance with the present invention, the mat 12 is selectively attached to a floor 18 of the commercial building 16 with fasteners capable of withstanding frequent laundering. Thus, the mat 12 is held firmly in place during use to reduce the likelihood of slip and fall accidents, but can be easily and frequently removed for laundering when soiled.

As shown by Fig. 2, the mat 12 comprises a flat carpet 20 with an integral rubber base 25 and a plurality of integral fasteners 30 protruding from a bottom 26 of the rubber base 25.

The carpet 20 includes a base fabric 22 and pile yarns 24 formed by tufting fibers to the base fabric 22 and trimming the top ends of the pile yarns 24. The process for making the carpet 20 is well known in the art and thus will not be further described herein.

The pile yarns 24 are yarns composed of cotton fibers, polyvinyl alcohol fibers, nylon fibers, or the like. In the preferred embodiment, the pile yarns 24 are composed of nylon fibers because of the durability, appearance, and resistance to linting of the same.

The rubber base 25 is cured directly to the base fabric 22 of the carpet 20. During the curing process, which is described below in detail, the rubber of the base 25 is vulcanized to cross link with the base fabric 22 and form a permanent bond. Accordingly, the mat 12 can withstand repeated laundering without the carpet 20 becoming separated from the rubber base 25. In the preferred embodiment, the rubber base 25 is made of nitrile-butadiene rubber (NBR) because of its resistance to oils and ability to withstanding frequent laundering. However, it will be understood by those skilled in the art that other types of rubber may be used within the scope of the present invention.

In the preferred embodiment, a fastener 30 is disposed at each corner of the rubber base 25 to provide

gripping support for the mat 12 in all directions. If wanted, a fastener 30 may also be disposed in the center of the rubber base 25 for further gripping support. Moreover, a fastener 30 may be located along each edge of the rubber base 25 or along a leading edge and a trailing edge of the rubber base.

As best shown by Fig. 3, each fastener 30 comprises two opposing sections of selectively attachable hook or loop material, such as that manufactured and sold by Aplix, Inc. of Charlotte, North Carolina. In the preferred embodiment, the selectively attachable material is loop material because it forms a better bond with the rubber base 25 and because it is less abrasive to the carpet 20 during laundering. Those skilled in the art will understand, however, that hook material may be used for one or both sections.

A first section of loop material 32 extends upwardly into the bottom 26 of the rubber base 25 and includes a first backing 33 abutting the bottom of the rubber base. A second, opposite facing section of loop material 34 protrudes downwardly from the first section 32 and includes a second backing 35 permanently bonded to the first backing 33. In the preferred embodiment, the second backing 35 is permanently bonded to the first backing 33 by stitching. Those skilled in the art, however, will understand that the backings may also be permanently bonded by ultrasonic welding or by water-resistant adhesives.

The mat 12 of the present invention is made by first separately forming the carpet 20 and the fasteners 30. As described above, the fasteners are formed by sewing the backings of the loop material together. Next, as shown by Fig. 4, the carpet 20 is placed in a curing press 50 above an uncured sheet of rubber 52 that will cure in the press to form the rubber base 25. The curing press 50 is of a type that is well known in the art and,

generally described, comprises a top platen 54 with heating coils 56 and a bottom bladder 58.

5 The fasteners 30 are disposed under, and at the corners of the rubber sheet 52. Thus, the rubber sheet 52 is sandwiched between the carpet 20 and the fasteners 30 such that the sheet will vulcanize and cross link with both the carpet and the fasteners.

10 The rubber sheet 52 is vulcanized by the process of heating the press 50 with the heating coils 56 to between 250 and 300 degrees Fahrenheit and inflating the bladder 58 to provide between 50 and 60 pounds pressure (psi) in the press. At the preferred temperature of 300 degrees Fahrenheit and pressure of 50 psi, the curing process takes between 15 and 25 minutes.

15 During the curing process, the heat softens the rubber sheet 52 while the pressure forces the first section of loop material 32 of each fastener 30 into the bottom 26 of the sheet. Accordingly, the rubber sheet 52 is cross linked with the loop material as the sheet is cured to form
20 a permanent bond. As used herein, the phrase permanent bond means a bond that will not become loosened or undone by normal use and extended commercial laundering. As a result, the mat 12 can withstand repeated laundering without the fasteners 30 becoming
25 separated from the rubber base 25.

After the curing process is finished, the mat 12 is removed from the curing press 50 and is ready for extended use and laundering.

30 During use, the fasteners 30 of the mat 12 are selectively attached to the floor 18 of the commercial building 16. In the preferred embodiment, as shown by Fig. 3, the fasteners 30 are attached with mating fasteners 60 anchored to the floor. The mating fasteners 60 may be anchored by adhesive tape and other well known
35 means.

Where the fasteners 30 comprise loop material, as

5 in the preferred embodiment, the mating fasteners 60
comprise hook material. Conversely, where the fasteners
30 comprise hook or other material, the mating fasteners
60 comprise a mating material. Thus, the fasteners 30
and the mating fasteners 60 form a fastening system 62
that allows the mat 12 to be selectively attached to the
floor 18 for use and easily removed for laundering when
the mat has become soiled. Further, because the fasteners
30 are permanently attached to the rubber base 25, they
10 can withstand repeated laundering such that the mat 12
can be reused for an extended period.

15 From the foregoing description of the preferred
embodiments and the several alternatives, other
alternative constructions of the present invention may
suggest themselves to those skilled in the art. Therefore,
the scope of the present invention is to be limited only to
the claims below and the equivalents thereof.

Claims

1. A selectively attachable floor covering capable of withstanding frequent laundering, comprising:
- 5 (a) a rubber base; and
- (b) at least one fastener with selectively attachable material extending into said base for permanent attachment therewith and with selectively attachable material protruding from said base for selective attachment with a floor.
- 10
2. The selectively attachable floor covering capable of withstanding frequent laundering as recited in Claim 1, wherein the selectively attachable material extending into said base comprises a first section and the selectively attachable material extending from said base comprises a second, opposite facing section secured to said first section.
- 15
3. The selectively attachable floor covering capable of withstanding frequent laundering as recited in Claim 2, further comprising a backing for said first section bonded to a backing for said second section to secure said first and second sections.
- 20
4. The selectively attachable floor covering capable of withstanding frequent laundering as recited in Claim 3, wherein said first and second sections comprise opposite ends of a unitary strip of selectively attachable material folded back over itself to expose the selectively attachable material on opposite facing sides.
- 25
5. The selectively attachable floor covering capable of withstanding frequent laundering as recited in Claim 1, wherein said selectively attachable material is loop material.
- 30
- 35

5 6. The selectively attachable floor covering capable of withstanding frequent laundering as recited in Claim 1, wherein a fastener is located at each corner of said rubber base.

10 7. The selectively attachable floor covering capable of withstanding frequent laundering as recited in Claim 6, further comprising a fastener located at a center of said rubber base.

15 8. The selectively attachable floor covering capable of withstanding frequent laundering as recited in Claim 1, wherein a fastener is located along a leading edge of said rubber base and also along a trailing edge of said rubber base.

20 9. The selectively attachable floor covering capable of withstanding frequent laundering as recited in Claim 1, wherein a fastener is located along each edge of said rubber base.

10. A system for selectively attaching a floor covering capable of withstanding frequent laundering, comprising:

- 5 (a) a rubber base;
- (b) at least one fastener with selectively attachable material extending into said base for permanent attachment therewith and with selectively attachable material protruding from said base; and
- 10 (c) a mating fastener attached to a floor having selectively attachable material for selectively receiving said selectively attachable material protruding from said base.

15 11. The system for selectively attaching a floor covering capable of withstanding frequent laundering as recited in Claim 10, wherein said selectively attachable material extending into said base and protruding from said base is loop material and wherein said selectively attachable material for selectively

20 receiving said material protruding from said base is hook material.

5 12. A method of producing a selectively attachable floor covering capable of withstanding frequent laundering, comprising the step of vulcanizing a portion of a fastener having opposing sides of selectively attachable material into a rubber base of a floor covering.

10 13. The method of producing a selectively attachable floor covering capable of withstanding frequent laundering as recited in Claim 12, wherein said vulcanizing step comprises the step of heating said rubber base to a temperature between 250 and 300 degrees Fahrenheit and pressing said portion of said fastener into said base with a pressure between 50 and 60 pounds pressure for between 15 and 25 minutes.

15 14. The method of producing a selectively attachable floor covering capable of withstanding frequent laundering as recited in Claim 12, further comprising the step of bonding a backing of a first section of selectively attachable material to a backing of a second section of selectively attachable material to produce said fastener having opposing sides of selectively attachable material.

20 15. The method of producing a selectively attachable floor covering capable of withstanding frequent laundering as recited in Claim 14, wherein said step of bonding comprises sewing said backing of said first section of selectively attachable material to said backing of said second section of selectively attachable material.

25 30

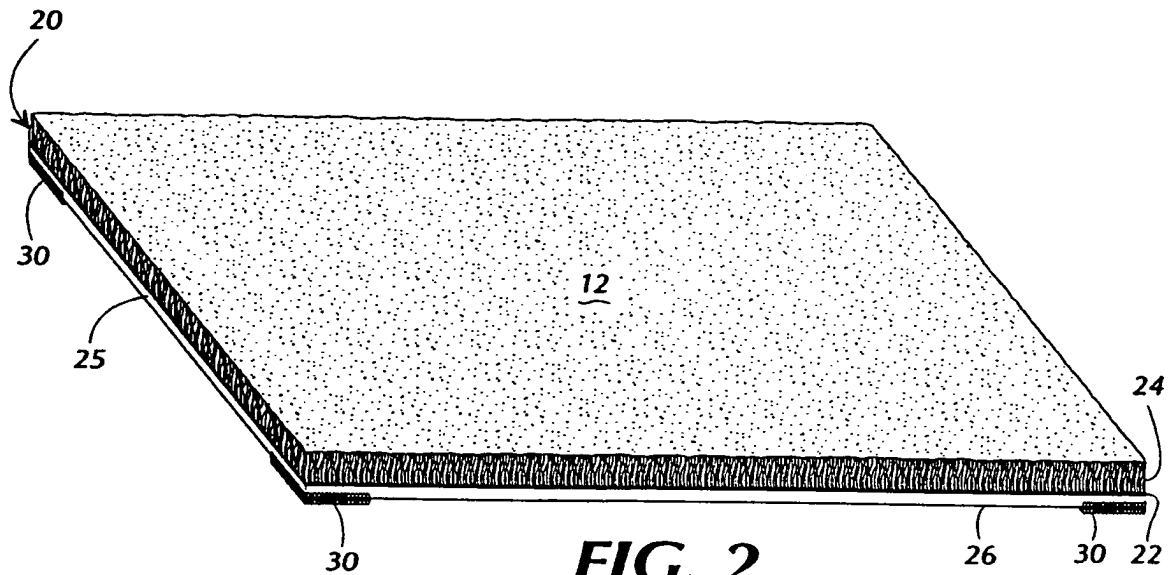
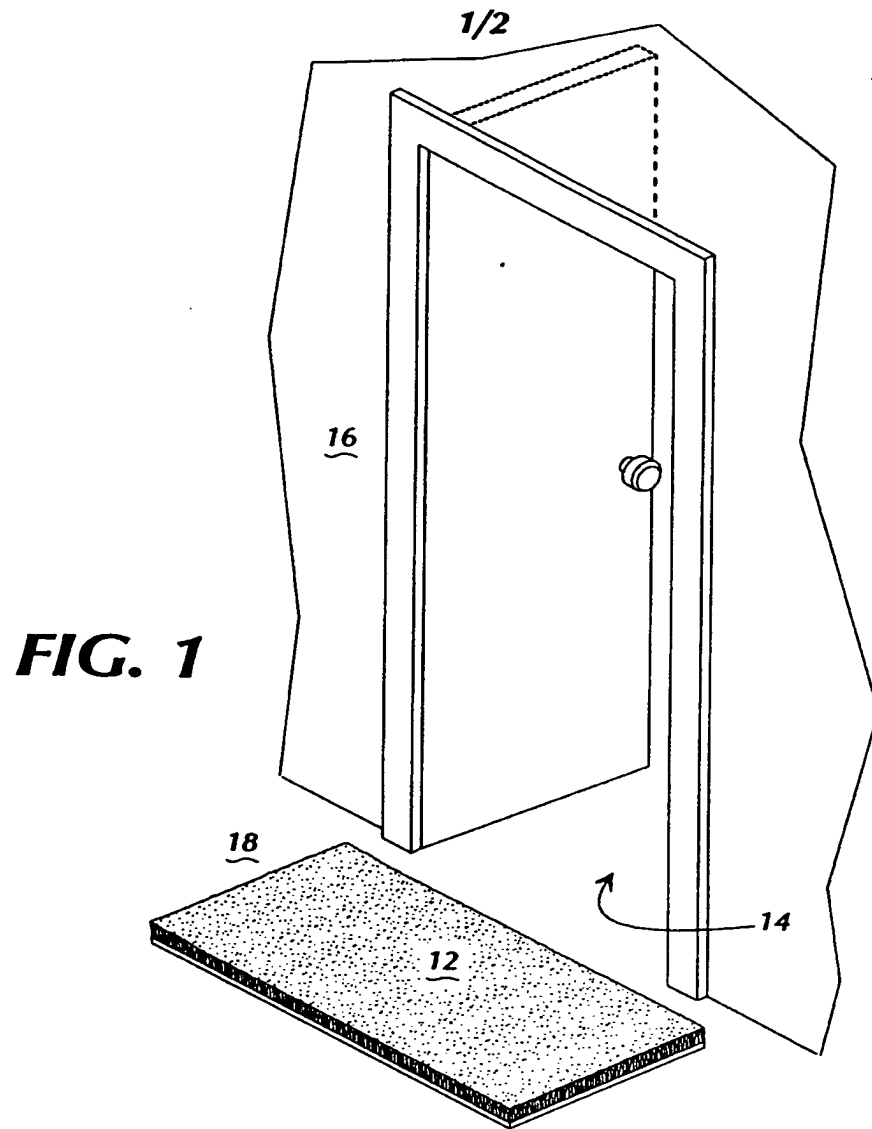
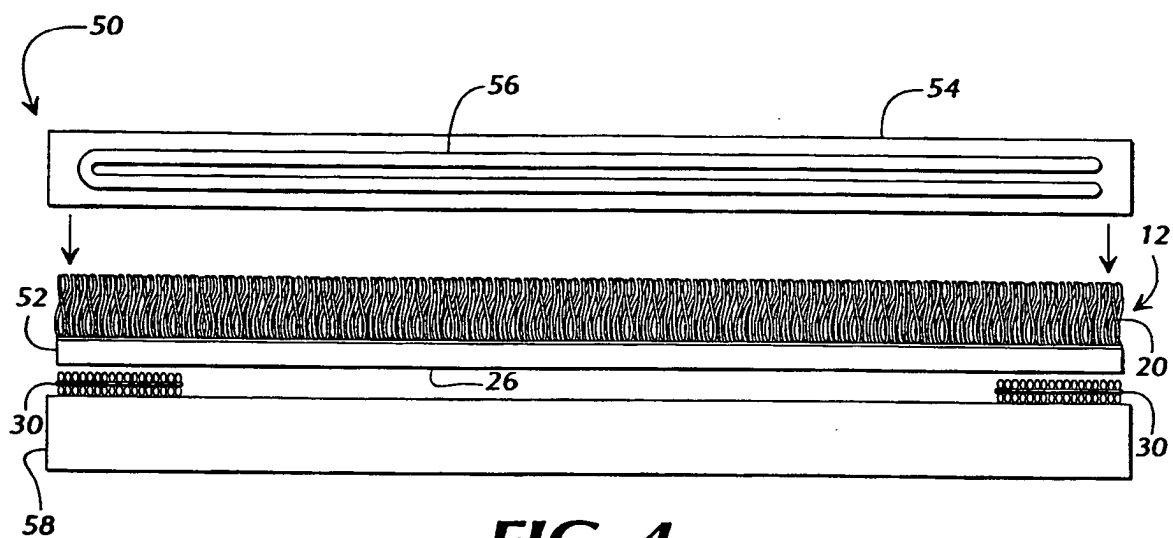
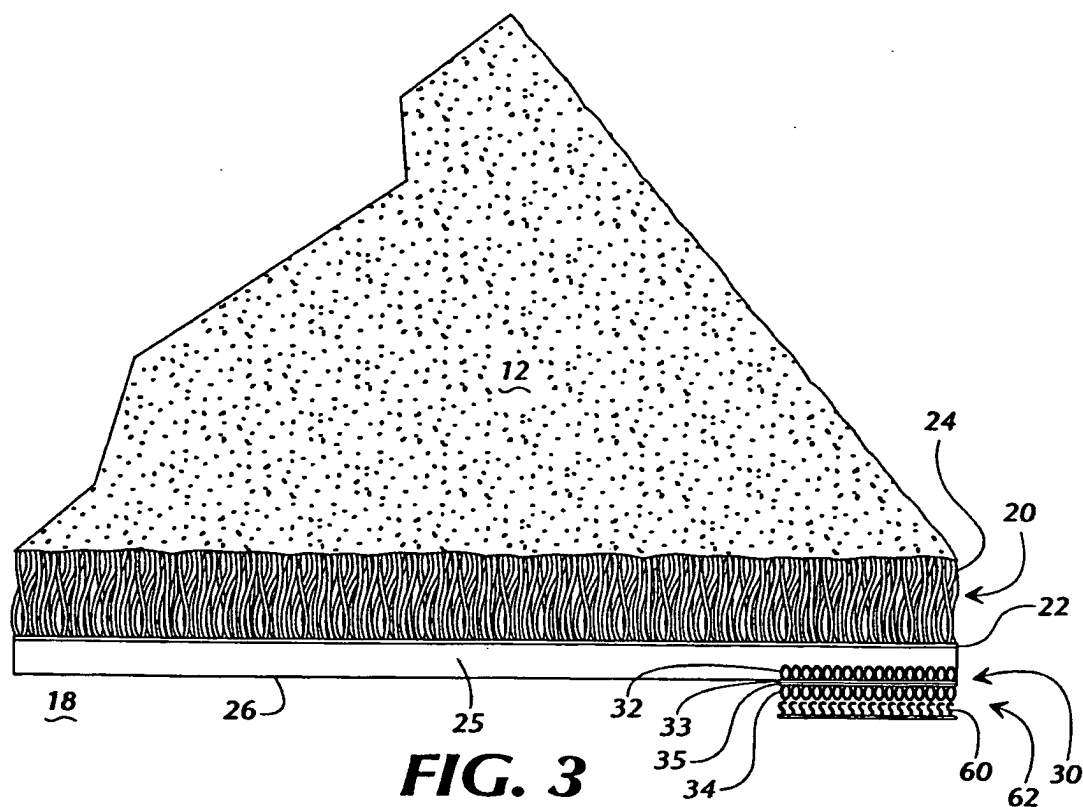


FIG. 2
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2/2



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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US95/07378

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) : Please See Extra Sheet.

US CL : Please See Extra Sheet.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : Please See Extra Sheet.

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|-----------|--|-----------------------|
| X | US, A, 4,822,658 (PACIONE) 18 April 1989, see entire document. | 1-15 |
| Y | US, A, 5,382,462 (PACIONE) 17 January 1995, see entire document. | 1-15 |
| Y | US, A, 5,060,443 (PACIONE) 29 October 1991, see entire document. | 1-15 |
| Y | US, A, 5,370,757 (CORBIN et al.) 06 December 1994, see entire document and Figure 2. | 1-15 |
| Y | US, A, 4,726,741 (HEDLEY) 09 August 1988, see entire document. | 1-15 |



Further documents are listed in the continuation of Box C.



See patent family annex.

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Date of the actual completion of the international search

01 AUGUST 1995

Date of mailing of the international search report

15 SEP 1995

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US95/07378

A. CLASSIFICATION OF SUBJECT MATTER:
IPC (6):

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A. CLASSIFICATION OF SUBJECT MATTER:
US CL :

428/86, 95, 100; 156/72

B. FIELDS SEARCHED

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Classification System: U.S.

428/86, 95, 100; 156/72